

signal and generating an electrical signal representative of the encoded signal;

20 (ii) a digital memory [means] for storing data representative of signature control signals;

(iii) programming means activated only during said system program mode for automatically storing, in said memory [means] received signals representative of said predetermined transmitter code as a signature control signal;

25 (iv) operating means activated during said operating-receiving mode for comparing received electrical signals with said signature control signal stored in said memory means to determine if said electrical signals correspond to said recorded signature control signal, and means for arming or disarming said vehicle antitheft  
30 means in response to received signals corresponding to said signature control signal stored in said memory; and

wherein said transmitter and said receiving means cooperate to form a one-way radio frequency signal transmission link for communicating signals only from said transmitter to said receiving means, said transmission link being employed by said system during said programming mode for transmitting said encoded signals from said transmitter to said access control unit to be stored in said memory as said signal control signals, said link further employed during said operating receiving mode for transmitting said encoded signals from said transmitter to said control unit.

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30. The [remote control access] vehicle security system of Claim 29 further characterized in that said [access] system control unit is operable in the program mode to record a plurality of different transmitter codes.

31. The [remote control access] vehicle security system of Claim 29 further characterized in that said [access] system control unit comprises a user-accessible switch disposed in said [secured area] vehicle, and said access control unit is responsive to the position of said switch for entering said program mode.

32. The [remote control access] vehicle security system of Claim 31 further characterized in that said program mode is automatically terminated after a pre-determined time delay from receipt of a transmitted encoded signal during said program mode.

33. The [remote control access] vehicle security system of Claim 29 further characterized in that said [access] system control unit is responsive to signature control signals received from a plurality of transmitters when the receiver is in the program mode for automatically recording each of the signature control signals from the plurality of transmitters as valid signature control signals, so that in the operating-receiving mode, the transmitted encoded signals from any of said plurality of transmitters are received and compared against each of said plurality of recorded signature control signals to determine if a valid signature control word has been received, said plurality of transmitters and said receiving means being operable at the same radio frequency.

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5 35. The [remote control access] vehicle security system of Claim 29 further characterized in that said transmitter is capable of generating a plurality of different encoded signals, and said [access] system control unit is operable in said program mode to record said plurality of different encoded signals.

5 37. The [remote control access] vehicle security system of Claim 29 wherein said transmitter is suitably encoded with said predetermined transmitter code by the manufacturer thereof so that the system user is not required to encode said transmitter.

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5 38. An electronically programmable remote control [access] vehicle security system [for controlling access to a secured area], in which a receiver and a control unit therefore are operable upon receipt of a proper transmitted encoded signal from any of a plurality of transmitters to arm or disarm said vehicle security system, said system comprising:

10 at least one first transmitter capable of transmitting a first receiver responsive, radio frequency, digitally encoded signal comprising an N-bit digital code word for arming and disarming said system, said transmitter comprising actuating means for actuating said transmitting of said signal so that said first signal is automatically transmitted upon actuation;

15 at least one second transmitter capable of generating and transmitting a second receiver responsive, radio frequency, digitally encoded signal comprising an M-bit digital code word for arming and disarming said system, said second transmitter comprising actuating means for actuating said transmitting of said second signal so that said

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first signal is automatically transmitted upon actuation;

25            wherein N and M are each integer values and N need not equal M;

vehicle antitheft means;

30            a receiver [remote from the transmitters] located in said vehicle and responsive to the transmitted radio frequency encoded signals during a system programming mode and a system operating-receiving mode for generating electrical signals corresponding to each of the respectively encoded signals;

35            said receiver and said first and second transmitters comprising at least first and second one-way radio frequency signal transmission links for communicating signals only from said first or second transmitters to said receiver during said system programming and system operating-receiving modes; and

40            a control unit operatively associated with the receiver, said control unit comprising:

45            (i) means for decoding said electrical signals to generate respective decoded digital signals representative of said N-bit code word and said M-bit code word;

            (ii) a digital memory for storing said N and M-bit code words;

50            (iii) means operable in said system program mode for automatically recording in said digital memory said respective decoded digital signals received and decoded during said program mode as first and second signature control signals representative of said N-bit code word and said M-bit code word; and

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[(iii)] (iv) means activated during an operating-receiving mode for comparing received and decoded signals to said first and second signature control signals which have been previously recorded during said program mode to determine if said decoded digital signals correspond to either of the recorded signature control signals and thereby represent valid signals for arming or disarming said [system] vehicle antitheft means.

39. The [remote control access] vehicle security system of Claim 38 further characterized in, that said control unit is a microprocessor operated control unit.

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40. The [remote control access] vehicle security system of Claim 38 further characterized in that the system is user programmable such that the user of any transmitter may initially record the encoded signal from that transmitter as a signature control signal in the control unit by simple actuation of the transmitter when the system is in said program mode, only requiring the transmission of the encoded signal from the transmitter for recording as a valid signature control signal, and whereby said signal control signal is automatically recorded in said digital memory.

41. The [remote control access] vehicle security system of Claim 40 further characterized in that said system is provided with a switch disposed in said [secured area] vehicle to put the receiver in the program mode.

42. The [remote control access] vehicle security system of Claim 41 further characterized in that said system program mode is automatically terminated after a pre-established time delay from receipt of a transmitted encoded signal during said program mode.

43. The [remote control access] vehicle security system of Claim 38 wherein said first and second transmitters are respectively suitably encoded with said N-bit and said M-bit digital codes by the respective manufacturer thereof so that the system user is not required to encode said respective transmitters.

53. A method of operating a user-programmable remote control [access] vehicle antitheft system in which an encoded signal from a transmitter may be recorded as a signature control signal in [an access] a control unit, said method comprising:

generating a receiver-responsive digitally encoded signal;

transmitting the generated receiver responsive encoded signal from a radio frequency, hand-held portable transmitter;

locating a radio frequency receiver responsive to the transmitted encoded signal in a position within the vehicle to receive the transmitted signal so that said transmitter and said receiver form a one-way radio frequency signal transmission link, and providing [an access] a control unit associated with the receiver;

operating said system in a program mode for recording any received encoded signal as a signature control signal in said access control unit;

generating an electrical signal at the receiver which is representative of the encoded signal;

decoding the electrical signal to provide a decoded signal;

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automatically recording the decoded signal as a signature control signal in said control unit when the system is operable in a program mode by only requiring the transmission of the encoded signal from the transmitter for recording as a signature control signal; and

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operating said system in a receive mode to decode further electrical signals representative of the encoded signals and compare the decoded signals to the recorded signature control signal, to determine if the decoded signal corresponds to the recorded signature control signal and thereby represents a valid signal for arming or disarming said antitheft system, or if the decoded signal does not correspond to the recorded control signal and thereby represents an invalid signal.

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54. [An automotive] A vehicle security system in which [an access] a control unit is responsive to receipt of a proper transmitted encoded radio frequency signal from a transmitter to arm or disarm said system, comprising:

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vehicle antitheft means;

a portable hand-held transmitter comprising means for generating and transmitting a predetermined digitally encoded, radio frequency, receiver-responsive signal representative of a predetermined transmitter code, and actuating means for actuating said generating and transmitting means so that said signal is automatically generated and transmitted upon actuation; and

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[an access] a control unit located within said vehicle, comprising:

(i) radio frequency signal receiving means operable during said program mode and during said system operating-receiving mode for receiving said transmitted encoded signal and generating an electrical signal representative of the encoded signal;

(ii) a digital memory [means] for storing signature control signals;

(iii) programming means activated only during a system program mode for automatically storing in said memory [means] said electrical signals representative of said radio frequency, receiver-responsive received signals representative of said predetermined transmitter code as a signature control signal; and

(iv) operating means activated during an operating-receiving mode for comparing received electrical signals with said signature control signal stored in said memory means to determine if said electrical signals correspond to said recorded signature control signal and for arming or disarming said [system] antitheft means if said electrical signals correspond to said recorded signature control signal, wherein said transmitter and said receiver means cooperate to form a one-way radio frequency signal transmission link for communicating signals only from said transmitter to said receiving means, said transmission link being employed by said system during said programming mode for transmitting said signal representative of said transmitter code to said access control unit to be stored in said memory means as signature control signals, said link further employed during said operating-receiving mode



for transmitting said encoded signal from said transmitter to said access control unit.

55. The security system of Claim [49] 54 further characterized in that said [access] control unit is operable in the program mode to record a plurality of different transmitter codes from a plurality of different transmitters.

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Add the following new claims:

62. The security system of Claim 54 wherein said control unit is operable in the program mode to record a plurality of different transmitter encoded signals of different code bit lengths as valid signature control words, and operable in the operating-receive mode to decode and compare said decoded signals of different bit lengths to each of said recorded signature control signals.

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63. The security system of Claim 54 wherein said transmitter comprises means for selectively generating and transmitting either a first or a second predetermined digitally encoded, radio frequency signal representative of first or second predetermined transmitter codes, said control unit is operable in the program mode to record respective signals representative of said first or second transmitter codes, and wherein said operating means comprises means for arming or disarming said antitheft means in response to receipt of signals corresponding to said first code, and means for performed a second predetermined function in response to signals corresponding to said second transmitter code.

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